



MANUAL CHANGE TRANSMITTAL		NO. 01-2
TITLE: Department of Transportation <i>Construction Manual</i>	APPROVED BY:  Robert Pieplow Chief, Division of Construction	DATE ISSUED: October 9, 2001
SUBJECT AREA Index and other areas of the <i>Construction Manual</i>	ISSUING UNIT Division of Construction	
SUPERSEDES None	DISTRIBUTION All Requested Manual Holders	

The purpose of this manual change transmittal is to provide updates and corrections to the 2001 edition of the Caltrans *Construction Manual*. Please update your manual in accordance with the table below. The relevant pages are indicated in the table.

Section(s)	Remove Old Page(s)	Insert New/Revised Page(s)
6-2, "Acceptance of Manufactured Material and Sampling Methods"	6-2.11	6-2.11 thru 6-2.14
Index	None	I-1 thru I-15
4-86, "Signals, Lighting and Electrical Systems"	None	4-86.i
4-90, "Portland Cement Concrete"	None	4-90.i
6-2, "Acceptance of Manufactured Material and Sampling Methods"	6-2.i	6-2.i

Sample deposits that have no open faces by means of test holes. When sampling material sites, select depth and spacing of test holes considering the probable method of operating the pit. In general, dozers will combine the material laterally. A shovel will remove the material vertically. Test results in a "spotty" pit may be misleading to the extent that operations may be too expensive in order to make the required grading.

If at all possible, use a dozer or shovel to open up the pit before sampling rather than depending on test holes.

6-203E Processed Aggregates

Sample processed aggregates, from locations such as stockpiles, transportation units, conveyors, or windrows in accordance with California Test 125, "Sampling Highway Materials and Products Used in the Roadway Structural Sections."

Table 6-2.2 Inspection of Fabricated and Manufactured Materials (1 of 3)

PRODUCT	ITEMS TESTED BY METS	ITEMS TO CHECK AT JOB SITE
Asphalt plank	Tests workmanship and dimensions	Workmanship and dimensions
Bolts and nuts	Tests, visual spot-check, marking. Spot-check galvanized high strength (ASTM A 325) nuts for proper lubricant	Visible defects, dimensions, threads, galvanizing, marking for correct type fit of nuts. Make sure high-strength bolts and nuts are used where specified and nuts are lubricated properly. (See Office of Structure Construction Records and Procedures.)
Ceramic tile	Tests, visual inspection in stack.	Damage, defects, dimensions
Casting, iron and steel, bronze	Material tests, visual and dimensional inspection	Dimensions, fillets, unauthorized repairs (welds fillers), defects
Clay pipe and drain tile	Tests, visual inspection, dimensions, marking	Damage, cracks and other defects, marking, straightness.
Concrete pipe	Tests, visual inspection, dimensions, elliptical steel markings	Damage, defects, exposed steel, dimensions, specific locations per plans), straightness, concentricity.
Corrugated metal pipe and structural plate pipe	Check mechanical tests, check coating tests, metal thickness (as marked), workmanship, diameter, etc. (spot-check), markings	Damage, visible defects, damaged galvanizing proper metal thickness for specific location, damage to bituminous coating. Check for weld defects, spacing and edge distance of rivets or spot welds, fit or bands, etc.
Curing compound (Chlorinated rubber type)	Material tests, marking. (Other types accepted at jobsite if properly packaged and labeled).	Proper mixing, marking, check sample. Check for specified type of container and correct marking.
Elastomeric bearing pads	Specifies tests, visual and dimensional inspection certification	Damage, defects, uniformity, dimensions
Electrical items, luminaries, controllers, signal heads, conductors, etc.	Controllers - complete tests and inspection Luminaries - random tests, visual inspection Signal heads, switches, etc. - visual inspection plans, type, operational check, etc. Conductors - random tests	Shipping damage, defects, conformance to plans, type, operational check, etc. Check loop detectors for operation under field conditions inspection. See that all conductors are correct type and size.
Epoxy	Specified tests, markings, packaging	Proper material for intended use, excessive thickening or crystallization, proper mixing
Expanded polystyrene	Material tests, general condition	Dimensions, general condition
Fencing, mesh, posts, gates, etc.	Coating and mechanical tests, visual inspection, dimensions	Damage, dimensions, general workmanship, galvanizing, condition of wood posts
Forgings, steel	Material tests, visual and dimensional inspection	Size, uniformity, surface defects, warping (permit no repairs).



Table 6-2.2 Inspection of Fabricated and Manufactured Materials (2 of 3)

PRODUCT	ITEMS TESTED BY METIS	ITEMS TO CHECK AT JOB SITE
Girders, concrete, precast, prestressed	Material tests, stressing and fabrication inspection (forms steel placement, concrete, etc.) workmanship, dimensions, conformance to plans	Damage, workmanship, exposed steel dimensions, finish, cracks or other defects
Head gates	Material check, visual and dimensional inspection	Damage, workmanship, dimensions, type
Joints Pourable joint sealing compound Premolded expansion joint filler	Lab tests, visual check Tests of each roll, visual inspection	Proper components, proper mixing, marking. Damage, workmanship, correct movement rating (from test report), size and type, lot and batch identification (See the <i>Bridge Construction Records and Procedures Manual</i> .)
Markers, pavement	Tests of each lot, random inspection	Damage, surface defects
Mechanical equipment, scales, pumps truck inspection stations, roadside rests	Inspection usually assigned to resident engineer. Consult with the Office of Structure Design, Mechanical & Electrical Stations, for assistance if required.	Damage, installation details, workmanship
Metal crib wall	Tests, visual inspection, galvanizing, dimensions.	Dimensions, workmanship, galvanizing, specified bolts
Miscellaneous iron and steel, misc. bridge metal, bearing assemblies, rings and covers frames and grates, etc.	Sampling and testing as specified, qualification of welders, inspection of fabrication, dimensions	Damage, welding or fabrication defects, conformance to drawings, galvanizing defects, grinding specified coating.
Paint	Specified tests, markings	Lumps, hard setting, color, marking of cans adherence, surface preparation, lot numbers(same as on inspection report).
Piling Concrete	Material check, stressing, fabrication, workmanship	Damage, workmanship (cracks, spalling, etc.) painting of strand ends, conformance to plans, straightness. Dimensions and workmanship
Sheet (when specified as cont. item)	Tests, dimensions, workmanship	See Timber, General. Check for straightness, required treatment
Timber		Check for straightness, required treatment, dimensions
Pipe, galvanized	Coating tests, visual and dimensional inspection	Size, uniformity, surface defects (permit no repairs)
Pipe, plastic	Material, tests, dimensions, workmanship and markings	Dimensions, workmanship, markings
Poles, lighting	Material and weld tests, visual and dimensional inspection	Dimensions, welds, workmanship, galvanizing type
Prestressing strand	Mechanical tests, wrapping, visual inspection when possible	Check strand for rust, damage, surface defects. Check tags for stressing information.

Table 6-2.2 Inspection of Fabricated and Manufactured Materials (3 of 3)

PRODUCT	ITEMS TESTED BY METS	ITEMS TO CHECK AT JOB SITE
Pull boxes (concrete)	Reinforcement, dimensions, workmanship	Cracks, rock pockets, exposed steel, dimensions
Railings, barriers Bridge railing, barrier, etc.	Material tests, welder qualifications, welding and fabrication, galvanizing	Damage to rail or galvanizing; fabrication or galvanizing defect, fit of sleeves, dimensions; types of bolts or nuts furnished
Metal beam guard rail	Material tests, fabrication, radius, dimensions, punching of holes, galvanizing, marking	Damage to rail or galvanizing; workmanship of rail and galvanizing; dimensions; conditions of holes, etc.
Railroad rail	Weight, general condition, rust	Dimensions, rust
Raised bars (precast)	Strength tests, visual inspection	Damage, surface defects, color
Sign structures	Material tests, qualification of welders, inspection during and after fabrication, dimensions, cleaning and painting or galvanizing, etc.	Damage, general workmanship, general conformance to requirements, position of sign panels, final check of electrical equipment for illuminated signs, proper nuts and bolts, properly torqued
Signs, changeable message	Fabrication, operation, workmanship	(See Section 4-56 of this manual.)
Steel, flooring and grating	Materials tests, workmanship and dimensions	Workmanship, dimensions
Structural steel	Material tests, qualifications of welders, inspection during fabrication, nondestructive testing, preparation and painting in the shop, conformance to plans and approved shop drawings, proper joint preparation for shop-bolted connections	Damage to members or paint: defects in steel or in welds; overlooked fabrication details; camber condition of paint; dimensions; condition of holes; proper bolts and nut markings; proper torquing; straightness and squareness of members
Timber, general	Visual inspection for grade and dimensions, treatment; retention and penetration; analysis of preservative; marking (See Piling, timber, also.)	Timber is usually inspected in the pile, so pieces should be inspected at the job site for damage, grade, deposits of excess preservative, etc. Some checking of dimensions also may be advisable. METS is available for advice or assistance as necessary.
Waterstop	Material tests, finish dimensions, uniformity	Finish, dimensions, uniformity
Welded steel pipe	Material tests, welder qualifications, welding inspection; and spark testing, marking, dimensions	Shipping damage, visible defects in pipe or coating marking, dimensions
Wire mesh reinforcing	Materials tests, visual inspection	Rust and broken welds



Index

A

Abbreviations	3-1.1
AC.....	See Asphalt Concrete
Acceptance of contract	3-7.12
Acceptance of materials	6-2.4
Acceptance records	6-1.4
Acceptance tests	6-1.2
Access to the work	3-5.3
Additives, chemical, water	4-17.1
Adhesive	4-95.1
Adjustment in compensation	5-3.6, 3-9.6, 5-3.36
Adjustment of overhead costs	3-9.15
Administration	1-0.1
Aggregate bases	4-26.1
Aggregate subbases	4-25.1
Air entrainment	4-90.11
Air pollution control	3-7.2, 7-1.3
Alternative equipment	3-5.4
Apprentices	8-1.7
Approach slabs	4-51.1
Arbitration	5-4.14
Asbestos sheet packing	6-1.25, 6-2.8
Asphalt membrane waterproofing	4-54.1
mopping	6-1.26
plank	6-1.25
Asphalt binder	4-39.1
Asphalt concrete	4-39.1, 6-1.16
Asphalt rubber latex joint filler	6-2.6
Asphalt treated permeable base	4-29.2, 6-1.21
Asphaltic emulsions	4-94.1
Asphalts	4-92.1
Audits	5-4.13
Authority of engineer	3-5.1
Authorized representative	3-5.1
Automotive	1-4.2
Award and execution of contract	3-3.1



B

Backflow preventers, irrigation systems	4-20.15
Bars, raised (precast)	6-1.27
Barbed wire	4-80.1, 6-1.25, 6-2.8
Barricades	4-12.2
Barriers	4-83.1
Barriers, railings and	4-83.1
Basement soil.....	6-1.23



Index

Bases	
aggregate	4-26.1
asphalt treated permeable	4-29.2, 6-1.21
cement treated	4-27.1, 6-1.20
cement treated permeable	4-29.2, 6-1.21
lean concrete	4-28.1, 6-1.18
Bearing devices, structures	4-51.3
Beginning of work	3-8.8
Bid openings	3-2.1
Bids	3-2.1
Bitumen ratio	4-37.6
Bituminous adhesive, pavement markers	4-85.1
Bituminous seals	4-37.1, 6-1.24
Blasting	4-19.2
Bolted connections	4-56.2
Borrow	
excavation	4-19.13
imported	4-19.9
Brick	6-1.26, 6-2.8
Bridge removal	4-15.2
Bridge deck finishing	4-42.2
Bridge railing	4-83.1
Budgeting	1-3.3
Buy America requirements	3-6.2

C

Cable railing	4-83.4
Calibration program for equipment	6-3.1
California test methods	6-3.3
California test number:	
109	6-3.6, 3-9.3
110	6-3.3
115	6-3.2
121	6-3.6
202	6-3.2
223	4-90.10
226	4-20.3
231	6-3.6
312	6-3.3, 6-1.20
338	4-27.2, 6-3.3, 6-1.20
339	4-37.3
375	6-1.17
504	6-3.2, 4-90.13
518	6-3.4, 4-72.3
523	4-40.4
526	6-3.3, 4-42.2, 4-40.8



Index

California test number: (<i>continued</i>)	
529	4-90.14
533	6-3.4
540	6-3.4
541	4-41.2
Carpobrotus cuttings	4-20.8
Cash expenditure voucher	1-5.2
Cast-in-place	
concrete pipe	4-63.1
concrete	4-50.1
Cement mortar	4-65.2
Cement treated	
permeable base	4-29.2
permeable material	4-68.2, 4-29.1
Cement treated bases	4-27.1
Certification of samplers and testers	6-1.3
Chain link fence	4-80.1
Chain link railing	4-83.4
Changeable message signs, portable	4-12.3
Channelizers	4-12.2
Character of workers	3-5.5
Claims	5-4.1
Cleaning up, final	3-4.1
Clearing and grubbing	4-16.1
Coating tests	6-1.2
Compliance, Certificates of	3-6.2
Compressive strength samples & tests	6-3.4
Concrete	
compressive strength	6-3.4
curbs and sidewalks	4-73.1
pavement, portland cement	4-40.1
railing	4-83.4
removal	4-15.2
retaining walls	4-51.1, 6-1.11
structures	4-51.1
Concrete barriers	4-83.4
Concrete structures	4-51.1
Cones, traffic	4-12.3
Construction area signs	4-12.2
Construction area traffic control devices	4-12.1
Contract acceptance	See Acceptance of contract
Contract change order	5-3.28
Control	
of materials	3-6.1
of work	3-5.1
Controlling operation	3-8.10
Copeland Act	8-1.20
Corrugated metal pipe	4-66.1

Index

D

Cost reduction incentive	3-5.7
Critical path method	3-8.10
CTB	4-27.1
Culverts, concrete	4-62.1
Curb ramps (wheelchair ramps)	4-73.1
Curbs and sidewalks	4-73.1
Curing compound	6-2.9
D	
Daily extra work	5-1.25
Damage, responsibility for	3-7.4
Damages, liquidated	3-8.28
Dampproofing	4-54.1
Davis Bacon Act	8-1.14
DBE	8-3.1, 3-8.1
Decreased quantities, increased and	3-4.2
Defective materials	3-6.2
Delays, right of way	3-8.35
Delineation	2-2.9
Delineators, markers	4-82.1
Details, shop	4-56.1
Detours	3-4.5
Differing site conditions	3-5.4
Disadvantaged business enterprise(s) DBE	8-3.1
Disposal sites	3-7.10
Disposal of material outside the highway right of way	3-7.10
Drain hole	4-86.7
Drainage inlets	4-51.1
Drainage pumping equipment	4-74.1
Drains	
horizontal	4-68.1
overside	4-69.1
subsurface	4-68.1
Dry sieve analysis	6-3.3
Dump truck rental	3-9.11
Dust control	4-10.1
Dust palliative	4-18.1

E

E

Earthwork	4-19.1
slipouts and slides	4-19.7
slope rounding	4-19.8
slopes, embankment	4-19.12
local borrow	4-19.9
Edge drains	4-68.1
Electrical	4-86.1
Eliminated items	3-4.3
Employee complaints	8-2.2

Index

Emulsions, asphaltic	4-94.1
Engineering fabrics	4-88.1
Entrained air	4-90.11
Environmental Quality Act	7-1.2
Epoxy	4-95.1
Equal employment opportunity	8-2.1
Erosion control	4-20.1
Erosion control and highway planting	4-20.1
Excavation	4-19.1
Execution of contract	3-3.1
Execution of contract, award and	3-3.1
Expansion joint armor	4-51.3

F

Facilities, existing highway	4-15.1
Fair Labor Standards Act	3-7.1
False Information Act	8-1.21
Falsework	3-7.2, 4-51.1
lighting	4-86.9
Fences	4-80.1
Field	
Inspection	3-5.6, 6-3.1
Laboratory	6-3.1
Office	1-4.1
Testing Equipment	6-3.1
Filter fabric	4-88.1
Final cleaning up	3-4.1
Finishing bridge decks	4-42.2
Finishing roadway	4-22.1
Flagging	4-12.1
Flashing arrow signs	4-12.2
Flashing beacons, portable	4-12.2
Fog seal coat	4-39.9
Force account payment	3-9.6, 5-3.1
Foreign materials	3-6.2
Form	
CEM-0101, Resident Engineer Report of Assignment	5-1.1, A-1.1
CEM-0501, Relief from Maintenance	5-1.1, A-1.2
CEM-0601, Construction Safety Report	5-1.2, A-1.3
CEM-0602, Project Safety Program Statement	5-1.2, A-1.4
CEM-0603, Major Construction Incident Notification	5-1.2, A-1.5
CEM-1201, Subcontracting Request	5-1.2, A-1.7
CEM-2001, National Pollution Discharge Elimination System	
Annual Certification	5-1.2, A-1.9
CEM-2002, Notification of Construction (NOC)	5-1.2, A-1.11
CEM-2003, Notification of Completion of Construction (NCC)	5-1.2, A-1.15
CEM-2101, COZEEP Daily Report	5-1.3, A-1.17



Index

Form (*Continued*)

CEM-2102, COZEEP/MAZEEP Task Order	5-1.3, A-1.19
CEM-2401, Substitution Report for Disadvantaged Business Enterprise/Disabled Veteran Business Enterprise	5-1.3, A-1.21
CEM-2402(F), Final Report- Utilization of Disadvantaged Business Enterprises (DBE), First - Tier Subcontractors (Federally Funded Projects)	5-1.3, A-1.23
CEM-2402(S), Final Report - Utilization of Disabled Veteran Business Enterprises (DVBE) State Funded Projects	5-1.3, A-1.25
CEM-2403(F), Disadvantaged Business Enterprises (DBE) Certification Status Change	5-1.3, A-1.27
CEM-2404(F), Monthly DBE Trucking Verification	5-1.3, A-1.29
CEM-2501, Fringe Benefit Statement	5-1.4, A-1.31
CEM-2502, Contractor/Subcontractor Payroll	5-1.4, A-1.32
CEM-2503, Statement of Compliance	5-1.4, A-1.33
CEM-2504, Employee Interview: Labor Compliance/EEO	5-1.4, A-1.35
CEM-2505, Owner - Operator Listing Statement of Compliance	5-1.4, A-1.37
CEM-2506, Labor Compliance —Wage Violation	5-1.4, A-1.39
CEM-2507, Labor Violation: Case Summary	5-1.4, A-1.41
CEM-2508, Contractor Payroll Source Document Review	5-1.4, A-1.43
CEM-2509, Checklist—Source Document Review	5-1.4, A-1.45
CEM-2601, Construction Progress Chart	5-1.5, A-1.47
CEM-2701, Weekly Statement of Working Days	5-1.5, A-1.49
CEM-2702, Overrun in Contract Time	5-1.5, A-1.51
CEM-3101, Notice of Materials to be Used	5-1.5, A-1.53
CEM-3501, AC Production/Placement Checklist	5-1.5, A-1.55
CEM-3701, Test Result Summary	5-1.5, A-1.57
CEM-3702, Relative Compaction Summary	5-1.5, A-1.58
CEM-4101, Materials Release Summary	5-1.5, A-1.59
CEM-4102, Material Inspected and Released on Job	5-1.5, A-1.60
CEM-4202, Material Plant Safety Checklist	5-1.5, A-1.61
CEM-4204, California Test 109 Sticker	5-1.6
CEM-4501, Resident Engineer Daily Report/Assistant Resident Engineer Daily Report	5-1.6, A-1.62
CEM-4601, Assistant Resident Engineer Daily Report	5-1.6, A-1.63
CEM-4701, Drainage System Summary	5-1.6, A-1.65
CEM-4801, Quantity Calculations	5-1.6, A-1.67
CEM-4900, Contract Change Order	5-1.6, A-1.68
CEM-4901, Contract Change Order Input	5-1.6, A-1.71
CEM-4902, Extra Work Bill (Short)	5-1.6, A-1.73
CEM-4902A, Extra Work Bill - Title Page	5-1.7, A-1.75
CEM-4902B, Extra Work Bill - Labor Charges	5-1.7, A-1.77
CEM-4902C, Extra Work Bill - Equipment Charges	5-1.7, A-1.79
CEM-4902D, Extra Work Bill - Material Charges	5-1.7, A-1.81
CEM-4903, Contract Change Order Memorandum	5-1.7, A-1.83
CEM-5101, Request for Payment for Materials on Hand	5-1.7, A-1.85
CEM-6001, Project Record - Estimate Request	5-1.8, A-1.86



Index

Form (*Continued*)

CEM-6002, Contract Administration System (CAS) –Report Requests	5-1.8, A-1.87
CEM-6003, Progress Pay - Estimate Project Initiation or Update	5-1.8, A-1.88
CEM-6004, Contract Transactions Input	5-1.8, A-1.89
CEM-6201, Notice of Potential Claim	5-1.8, A-1.91
CEM-6301, Contract Acceptance	5-1.8, A-1.93
CEM-9001 Construction Manual Proposed Change	5-1.8, A-1.95

Office of Materials Engineering and Testing Services Forms

TL-0028, Notice of Materials to be Inspected	5-1.8
TL-0029, Report of Inspection of Material	5-1.9
TL-0101, Sample Identification Card	5-1.9, A-1.96
TL-0502, Field Sample of Portland Cement Concrete Sample Card	5-1.9, A-1.97
MR-0518, Job Cement Samples Record	5-1.9, A-1.98
TL-0608, Notice of Materials to be Furnished	5-1.9
TL-0624, Inspection Release Tag	5-1.9
TL-0649, Inspector’s Report of Material on Hand	5-1.9
TL-3096, Pavement Core Record	5-1.9
TL-6037, Fabrication Progress Report	5-1.9

Other State Forms

DAS-1, Apprentice Agreement	5-1.9
H-ESP-16, Request for Construction Staking	5-1.9
LA-16, Product, Material, or Method Report	5-1.9, A-1.99
LA-17, Report of Chemical Spray Operations	5-1.9, A-1.100
TR-0019, Notice of Change in Clearance or Bridge Weight Rating	5-1.9, A-1.101
TR-0020, Notice of Change in Vertical or Horizontal Clearance	5-1.9, A-1.102
TR-0029, Notice of Change in Clearance or Bridge Weight Rating	5-1.9, A-1.103

Federal Forms

FHWA-47 Statement of Materials and Labor used by Contractors on Highway Construction involving Federal Funds	5-1.11
FHWA-1022, United States Department of Transportation Notice	5-1.11
FHWA-1391 Federal-Aid Highway Construction Contractors Annual EEO Report	5-1.11
DOL SF-308 Request for Wage Determination and Response to Request	5-1.11
Equal Employment Opportunity is the Law Poster	5-1.11
FHWA-1495, Wage Rate Information Federal-Aid Highway Project	5-1.11
Forms used for contract administration	5-1.1
Funds/Funding	5-2.1, 9-1.1

G

Geo-synthetics	6-1.26
Glass beads	4-84.1
Grading plane	3-5.3
Grates, frames and miscellaneous metal	4-75.1
Groove and grind pavement	4-42.1
Guard railing, metal beam	4-83.1
Guide posts	6-1.2



Index

H

Handrailing	4-83.4
Highway facilities, existing	4-15.1
Highway planting	4-20.1
Hook details	4-52.1
Horizontal drains	4-68.1
Hydraulic jacks	6-3.3
Hydroseeding	4-20.2

I

I

Imported borrow	4-19.9, 6-1.23
Increased and decreased quantities	3-4.2
Indemnification and insurance	3-7.8
Independent assurance sampling and testing	6-1.3
Items	
eliminated	3-4.3
final pay	3-9.6

J

J

Jacking	
corrugated steel pipe	4-66.2
pavement	4-41.1
reinforced concrete pipe	4-65.2
Job categories, alphabetical list of	5-1.32
Job categories, numerical list of	5-1.30
Joint filler expansion	6-1.26
Joint sealing compounds	6-1.26, 6-2.6

L

L

Labor surcharge	3-9.8
Labor Code	8-1.1, 3-7.1
Labor compliance	8-1.1
Laws to be observed	3-7.1
Lean concrete base	4-28.1
Legal relations and responsibility	3-7.1
Licensing laws, contractor	3-7.1
Lime stabilization	4-24.1
Lines and grades	3-5.3
Liquid asphalts	4-93.1, 6-1.4
Load limitations	3-7.1
Local	
Assistance	9-1.1
Roads	3-4.5
Local borrow	4-19.9
Local material	3-6.3
Log of test borings	3-5.4

Index

M

Maintenance and responsibility, relief from	3-7.10
Manholes	4-70.1
Manual of Traffic Controls	4-12.1, 2-2.1
Markers	
and delineators	4-82.1
object	4-82.1
pavement	4-85.1
Median barriers	4-83.3
Mesh-reinforcing	6-1.27
Metal beam guard railing	4-83.1
Metal railing	4-83.2
Mineral admixtures	4-90.14
Minor B projects	3-2.1
Minor concrete	4-90.5
Minor structures	4-51.2
Miscellaneous	
iron and steel	4-75.1
metal	4-75.1
Miscellaneous facilities	4-70.1
Mix design	4-90.7
Mobilization	4-11.1
Monuments	4-81.1

M

N

Night work	2-2.8, 7-1.8
Non-highway facilities, utility	3-8.36
Notices, stop	3-9.15
Nuclear Gages	1-4.2, 6-3.6

N

O

Object markers	4-82.1
Obliterating roads and detours	4-15.1
Office Engineer, Office of	3-3.1
Operation, controlling	3-8.10, 5-0.5
Order of work	3-5.2, 3-7.5
Overhead costs, adjustment of	3-9.6, 5-3.14
Overhead sign structures	4-56.2
Overside drains	4-69.1
Owner-operated equipment	3-9.11, 5-5.6, 8-1.11
Owner-operators	5-1.4, 8-1.10, 8-1.11, 8-1.14

O

Index



P

Palliative, dust	4-18.1
Partial payments	3-9.16
Pavement	
asphalt concrete	4-39.1
joints, longitudinal	4-39.9
joints, transverse	4-39.9
grind	4-42.1
groove	4-42.1
jacking	4-41.1
portland cement concrete	4-40.1
subsealing	4-41.1
Pavement markers	4-85.1
Pavement recesses	4-85.2
Pavement reinforcing fabric	4-88.1
Payment	
final	3-9.24
force account	3-9.6
measurement and	3-9.1
Payroll records	8-1.5
PCC pavement (see also portland cement concrete)	
joints, contact	4-40.8
joints, weakened plane	4-40.7
slip-form	4-40.2
thickness deficiency	4-40.10
tie bars for	4-40.3
water supply for	4-90.5
weakened plane joints	4-40.7
Penetration treatment	6-1.24
Perforated pipe	4-68.1
Permeable base	
asphalt treated	4-29.2
cement treated	4-29.2
Permits, encroachment	9-1.2
Pervious backfill material	4-19.11
Pesticides	4-20.6
Pigmented curing compound	6-1.10
Piling	4-49.1
Pipe	
alternative pipe and pipe arch culverts	4-62.1
cast-in-place concrete	4-63.1
corrugated metal	4-66.1
corrugated metal, aluminum	4-66.1
corrugated metal, steel	4-66.1
plastic	4-64.1
reinforced concrete	4-65.1
structural metal plate	4-67.1

Index

Plans	
working drawings	3-5.1
intent of	3-4.1
Plant establishment work	4-20.12
Plant pumping equipment	4-74.1
Plant stakes, highway planting	4-20.10
Plants	
highway planting and erosion control	4-20.1
watering	4-20.11
Plastic pipe	4-64.1, 4-20.1
Pollution control	
air	7-1.10
storm water	7-1.4
water	7-1.3
Polysulfide	6-1.26
Polyurethane	6-1.26
Portable	
changeable message signs	4-12.3
delineators	4-12.2
Portland cement concrete	4-90.1
admixtures	4-90.3, 6-1.9
compressive strength	6-3.4
Portland cement concrete pavement	4-40.1
Potential claim, notice of	5-4.2
Precast raised traffic bars	6-2.8
Preliminary tests	6-1.1, 5-1.19
Preparing planting areas	4-20.9
Preservation of property	3-7.8
Preservative treatment of lumber, timber and piling	4-58.1
Prestressing concrete	4-50.1
Prevailing wage	8-1.16
Priority tests	6-1.2
Procedure and protest	3-4.2
Profile index	4-42.2
Profilograph	6-3.3
Progress	
of work	3-8.26
prosecution	3-8.1
schedule	3-8.10
Progress pay estimate project initiation of update	5-1.57
Project certification	6-1.5
Project records	5-1.1
categories, alphabetical list of	5-1.32
categories, numerical list of	5-1.30
Property, preservation	3-7.8
Proposal requirements and conditions	3-2.1
Proposed final estimate	3-9.26
Prosecution and progress	3-8.1

Index

Public access to project records	5-1.69
Public convenience	3-7.3
Public interest	3-6.6
Public relations	1-2.1
Pull boxes	4-86.7

Q

Quality Assurance Program	3-9.3, 6-1.3
---------------------------------	--------------

R

Railings (Type K), temporary	4-12.2, 4-83.1
Railings and barriers	4-83.1
Reinforced concrete pipe	4-65.1
Reinforcing bars	4-52.1
Reinforcing fabric	4-88.1
Relative compaction	6-3.6
Relief from maintenance and responsibility	3-7.10
Remote control valves	4-20.15
Removal of rejected and unauthorized work	3-5.3
Removal, bridge	4-15.2
Rental	
dump truck	3-9.11
equipment	3-9.9
Responsibility for damage	3-7.4
Retaining walls, concrete	4-51.1, 6-1.11
Retroreflective pavement markers	4-85.1
Right-of-way delays	3-8.35
Rights in land and improvements	3-7.12
Roadside signs	4-56.1
Roadway excavation	4-19.1
Rock slope protection	4-72.1
Rock slope protection fabric	4-88.1
Root protectors, highway planting	4-20.5
Rubber	6-1.2

S

Safety and health provisions	2-1.1
Sample	6-1.1
Sampling & testing	6-1.1
Scale sheets	3-9.4
Scales	6-3.2
Scales and balances	6-3.2
Scope of work	3-4.1
Screens and sieves	6-3.2



Index

Seal coats	4-37.1
Seed	4-20.2
Semifinal estimate	3-9.3
Shop details	4-56.1
Shoring	4-19.1
Shortage of materials	3-8.28
Shotcrete	4-53.1
Sidehill embankment	4-19.5
Sidewalks	4-73.1
Sieve analysis	6-3.2
Sign structures	4-56.1
Signals, lighting and electrical systems	4-86.1
Signs	4-56.1
Silos, asphalt concrete	4-39.8
Slides and slipouts	4-19.7
Slipouts and slides	4-19.7
Slope	
embankment	4-19.12
paving	4-72.4
protection	4-72.1
rounding	4-19.8
Slotted pipe, edge drains	4-68.4
Slurry seal	4-37.5, 6-1.24
Soil, basement	6-1.23
Sound control requirements	3-7.3
Source documents	3-9.2
Special forces	3-9.13
Special services	3-9.13
Speed zones	2-2.7
Stakes and marks	3-5.3
State Contract Act	1-1.5
State-furnished materials	3-6.1
Stop notices	3-9.15
Straw, erosion control	4-20.2
Striping	4-84.1
Structural metal plate pipe, arches and pipe arches	4-67.1
Structural steel	4-51.1
Structure backfill	4-19.11, 6-1.25
Structure excavation	4-19.3
Structure excavation and backfill	4-19.3
Styrofoam filler	6-2.8
Subbases, aggregate	4-25.1, 6-1.22
Subcontracting	3-8.1
Subsealing pavement	4-41.1
Subsistence and travel allowance	3-9.8, 8-1.6
Substitution request-DBE/DVBE	8-3.7
Subsurface drains	4-68.1

Index

Superintendence	3-5.2
Surcharge, labor	3-9.8
Survey monuments	4-81.1
Suspension of work, temporary	3-8.10

T

Temporary railing (Type "K)	4-12.2
Temporary suspension of work	3-8.10
Termination of contract	3-8.38
Termination of control	3-8.31
Test borings, log of	3-5.4
Test/testing	6-3.1
Test cylinders	6-3.4
Thermoplastic traffic stripes and pavement markings	4-84.1
Thrie beam barrier	4-83.2
Tile	6-2.8
Timber piles	3-8.29
Timber structures	4-57.1
Time of completion	3-8.11
Traffic cones	4-12.3
Traffic control devices, construction area	4-12.1
Training	1-3.1
Treated permeable bases	4-29.1
Trenches	4-19.5
Truck rental, dump	3-9.11

U

Underdrains	4-68.1
Unsuitable material	
earthwork	4-19.6
removing	4-19.6
Use of materials found on the work	3-4.6
Use of pesticides	4-20.6
Utility and non-highway facilities	3-8.36

V

Vehicle Code	3-7.1
Vehicle detectors	4-86.9

W

Wage, prevailing	8-1.16
Water	4-17.1
Water pollution control	7-1.3
Water pollution control plan	7-1.7



Index

Water supply	4-17.1
Waterproofing	4-54.1, 6-1.27
Waterproofing, asphalt membrane	4-54.1
Waterstops, concrete structures	4-51.4
Weep holes	
concrete slope protection	4-72.4
concrete structures	4-51.4
Weigh sheets	4-20.3
Weights and measures	3-9.2
Welded steel pipe	4-70.1
Welded wire fabric	4-52.1, 6-2.8
Wheelchair ramps	
curb ramps, concrete	4-73.1
Windrows	4-39.9
Wire mesh, fences	4-80.1
Wire mesh reinforcing	6-1.27
Wiring	4-20.17
Working drawings	3-5.1

Section 86 Signals, Lighting and Electrical Systems

4-8601 General

4-8602 Before Work Begins

4-8602A Materials

4-8603 During the Course of Work

4-8603A Foundations

4-8603B Standards

4-8603C Conduit

4-8603C (1) Metal Conduit

4-8603C (2) Plastic Conduit

4-8603D Pull Boxes

4-8603E Conductors

4-8603F Vehicle Detectors

4-8603G Soffit and Wall Luminaires

4-8603H Falsework Lighting

4-8603I Testing

4-8603J Completing the Project

4-8603K Forms

4-8603L Guaranties

4-8604 Measurement and Payment

Example 4-86.1 Example Checklist

Section 90 Portland Cement Concrete**4-9001 General****4-9002 Before Work Begins**

4-9002A Materials

4-9002B Aggregate Gradings

4-9002C Admixtures

4-9002D Proportioning

4-9002E Curing Concrete

4-9002F Compressive Strength

4-9002G Minor Concrete

4-9002H Design of Mix

4-9002H (1) Selecting Proportions *4-9002H (1a) Cement Content* *4-9002H (1b) Water Content* *Table 6-90.1 Estimate of Free Water Content for Initial Design* *4-9002H (1c) Combined Grading of Aggregate* *4-9002H (2) Computations for Mix Design* *Example 4-90.1 Sieve Analysis and Combined Grading for Portland Cement Concrete, 37.5 mm Maximum* *4-9002H (2a) Preliminary Data and Source* *4-9002H (2b) Absolute Volumes* *4-9002H (2c) Quantities Per Cubic Meter* *4-9002H (2d) Batch Weights Per Cubic Meter* *4-9002H (2e) Scale Weights for Batching Plants* *4-9002H (3) Reproportioning for Air Entrainment* *4-9002H (4) Adjustment of Initial Mix Design***4-9003 During the Course of Work**

4-9003A Proportioning and Mixing Operations

4-9003B Mixing and Transporting

4-9003C Curing Concrete

4-9003D Protecting Concrete

4-9004 Measurement and Payment

Section 2 Acceptance of Manufactured Material and Sampling Methods

6-201 General

6-202 Responsibilities and Procedures for Acceptance of Materials

6-202A The Contractor

6-202B Office of Materials Engineering and Testing Services

6-202B (1) Source Inspection

6-202B (2) Assignment to a unit of METS or a District Materials Laboratory

6-202B (3) Form TL-0624, "Inspection Release Tag."

6-202B (4) Assignment to a commercial laboratory

6-202B (5) Assignment to the Resident Engineer.

6-202C The District

6-202D The Resident Engineer

6-202D (1) Inspection Verification

6-202D (2) Source Inspection

6-202E Materials Accepted on the Basis of a "Certificate of Compliance"

6-202E (1) Bituminous Materials

6-202E (2) Asphalt Rubber Latex Joint Filler

6-202E (3) Two-component Joint Sealing Compounds

6-202E (4) Portland Cement

6-202E (5) Reinforcement

6-202E (6) Signing and Delineation Materials

6-202E (7) Required Attachments for Acceptance

Table 6-2.1 Materials Accepted by Resident Engineer

6-203 Materials Manufactured to Caltrans-specified Formulation

6-203A Paint

6-203B Concrete Curing Compounds

6-203C Epoxy

6-203D Unprocessed Soils and Aggregates

6-203D (1) Stone from Ledges and Quarries

6-203D (2) Material Sites of Sand, Gravel, or Soil

6-203E Processed Aggregates

Table 6-2.1 Inspection of Fabricated and Manufactured Materials